

Application No. 10/500,248
Filed: June 25, 2004
TC Art Unit: 3746
Confirmation No.: 8913

REMARKS

Claims 1-3, 5, 6, 12, and 13 have been rejected under 35 U.S.C. § 102(b) and claims 7-11 have been rejected under § 103(a) over Barrett et al. (US 3,811,713). Reconsideration of these rejections is respectfully requested.

Barrett shows an entirely steerable nozzle 14 having a converging portion, upstream of the throat portion, provided with spherical surfaces cooperating with spherical surfaces provided at the rear end wall 12 of the combustion chamber. The nozzle is connected to the rear end wall 12 by means of a cardan-type arrangement.

As is clearly explained in Barrett (col. 2, lines 17-24), the seal at the junction between the parts 12 and 14 is provided by an annular flexible diaphragm 34 of bellows-type outside of the facing spherical surfaces. Thus, gas-tightness is achieved by the bellows-type seal, not through the contact between the spherical surfaces.

The seal arrangement includes a rubber-like ring 40 having end edges bonded to the nozzle 14 and wall 12 (col. 2, ll. 30-32).

Barrett explains (col. 2, lines 45-51) that angular deflection of the nozzle 14 increases the stretch of the rubber-like ring 40 on one side of the nozzle axis and decreases the stretch on the other side. Barrett also explains that the primary

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resistance to angular deflection of the nozzle is offered by the flexible bellows 34.

From the passage at col. 2, lines 42-46, it is understood that pivoting of the nozzle will cause a portion of the rubber-like ring 40 to be less and less stretched and finally compressed. This means that, at some point, the ring 40 will exert a resilient force in a direction to space the nozzle 14 and the wall 12 apart from one another. This will not be detrimental to the tightness between the nozzle 14 and the wall 12 because such tightness is achieved by the outside seal.

The bellows 34 is similarly deformed. However, because the bellows is flexible (not resilient), no return force is generated.

In contrast, the present invention provides for resilient return means, which for any position of the moving portion of the nozzle, ensures that the spherical surfaces remain applied against one another in a gas-tight manner. Thus, no external seal needs to be provided. The tightness is provided only by the maintaining of the spherical surfaces in close mutual contact.

Regarding claims 10 and 13, there is no direct or implicit disclosure in Barrett that the gimbal ring 16 of the cardan could be resiliently deformable.

Accordingly, claims 1, 12, and 13, and the claims dependent therefrom are believed to be patentable over Barrett.

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Claims 1 and 4 have been rejected under § 103(b) over Rossmanith (DE 3119183 A1). Reconsideration of this rejection is also respectfully requested.

Fig. 2 of Rossmanith has to be considered in connection with Fig. 1. In Fig. 1, it is clear that the upstream portion of the steerable nozzle 3 has spherical surfaces that cooperate with spherical surfaces provided at the rear end portion of the combustion chamber, with an O-ring provided therebetween.

Thus, Rossmanith does not disclose any resilient return means that would apply the above spherical surfaces one against the other to ensure gas-tightness therebetween for all positions of the nozzle.

The Examiner refers to spring 47 shown on Fig. 2 as a resilient return means. Fig. 2 shows the arrangement of the nozzle activating means located outside the combustion chamber. Those activating means include jacks that are angularly distributed. The passage at page 9, lines 25-27, reads: "The driving of the steerable nozzle is produced by means of four circumferentially distributed hydraulic cylinders 30, 31, 32, the fourth one not being represented on Figure 2."

Fig. 2 shows two different transverse sections. The piston rod 37 is connected to the rear end portion of the steerable nozzle at the periphery thereof, like rods 36, 38. Thus, if any resilient force is exerted by the spring 47, this is at the periphery of the rear end portion of the steerable nozzle, namely

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in the region of space 22 of Fig. 1. Thus, the effect of spring 47 would be to exert a force having a tendency to space apart the spherical surfaces of the portions 23 and 24 of the combustion chamber end wall and of the nozzle. The effect of spring 47 would then be exactly contrary to the effect needed to ensure gas-tightness. Accordingly, claims 1 and 4 are believed to be patentable over Rossmanith.

Regarding US 3,570,768, mentioned by the Examiner, Applicants note that Fig. 3 shows the sealing arrangement provided between spherical surfaces 26, 28. It is expressly mentioned that those surfaces are spaced apart from one another (col. 1, ll. 72-73). In addition, no resilient return means is apparent.

Regarding US 3,140,584, also mentioned by the Examiner, Applicants note that Fig. 1 does not show a static portion and a moving portion of a nozzle having respective spherical surfaces in gas-tight mutual contact.

Claim 13 has been rejected under 35 U.S.C. § 112, second paragraph. Claim 13 has been amended to correct the lack of antecedent basis noted by the Examiner.

A typographical error has been corrected in the specification.

The drawings have been objected to. The Examiner requests that "the ring of the cardan mount being elastically deformed on assembly" from claim 13 be shown in the drawings. Claim 13 as amended recites that the ring is elastically deformable. The ring

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30 is illustrated, for example, in Fig. 2. See also the description of this embodiment at, for example, page 3, lines 23-26, and page 8, lines 10-16, of the specification. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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